

**ENGINEER SURVEYOR'S REPORT ON MACHINERY.**

**ENGINES.**

Rec 10/2/77

No. Port Report (if any) on Hull of Vessel.

Description *Comp<sup>d</sup> Invt<sup>d</sup> S. A. S. Con<sup>day</sup>*  
 Made by *Messrs Forester & Coy*  
 When 1876 At *Liverpool*  
 Diameter of cylinders *2 of 28" 2 of 56"* Length of stroke *42"*  
 No. of revolutions per minute *about 60*  
 Point of cut off *5ths*  
 Diameter of screw shaft *13 1/2"*  
 Diameter of crank shaft journals *13 1/2"*  
 Diameter of screw, or of paddle wheel *17 ft*  
 Pitch of screw *20 ft*  
 No. of blades, *Four* Total surface *67 ft.*  
 No. of bilge pumps *2* and sizes *4 1/4"*  
 Do they pump from each compartment *Yes*

Are all the bilge suction pipes fitted with roses *Yes*  
 No. of feed pumps *Two* and sizes *4 3/4"*  
 What gauges are there attached to the engines and boilers ... *2 Steam gauges to each boiler 1 Steam & 1 Vacuum in C. Room*  
 Description and size of Donkey Pumps ... *3" Applunger & Actmng*  
 Where do they pump from ... *Sea, bilges & condensers. To Boilers. 0<sup>bd</sup> & deck.*  
 No. of bilge injections *One* and sizes *4"*  
 Are they connected to air, or circulating pumps *Air pumps*  
 Is there a hand pump in the engine room *Yes*  
 Can it be worked by the main engines *No.*  
 Is there a deck hose of sufficient length to reach to any part of the vessel *Yes*

**MAIN BOILERS.**

Number *Two* Description *Double ended, cylindrical*  
 Made by *Messrs Forester & Coy*  
 When 1876 At *Liverpool*  
 Working pressure *75 lbs.*  
 Tested by hydraulic pressure to *150 lbs.* Date *1<sup>st</sup> August 1876*  
 Description of super-heating apparatus *Circular, horizontal*  
 Can each boiler be worked separately *Yes*

Can the ~~super-heater~~ <sup>Steam chest</sup> be shut off and the boilers worked separately *Steam chest - no*  
 Description and area of safety valves on each boiler ... *2 of 28-27" area on each boiler*  
 No. of square feet of fire-grate surface in each boiler *95 ft.*  
 Are there separate blow off and brine cocks on each boiler, independent of those on the vessel's skin *Yes*  
 Are all pipes, cocks, roses, and pumps in connection with the machinery accessible at all times. *Yes*

**2 DONKEY BOILERS.**

Description *Vertical, circular, cross tubes*  
 Where fixed *In casing on upper deck*  
 Working pressure *75 lbs*

Tested by hydraulic pressure to *150 lbs (static)* Date *5<sup>th</sup> Sept*  
 Description and area of safety valves *2 of*  
 No. of square feet of fire grate *10 1/2*

**PIPES, COCKS, AND CONNECTIONS.**

Are all connections with the sea direct on the skin of the ship *Yes*  
 Are they Kingston valves or common cocks ... *Common cocks & chests*  
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stoke hold plates ... *No. bilge suction pipes & cocks are under*  
 Are the discharge pipes above or below the deep water line *Above*  
 Are they each fitted with a discharge valve on the plating of the vessel *Yes*

What pipes are carried through the bunkers *not any*  
 How are they protected *At this time*  
 When were the stern tube, propeller, screw shaft, and all connections examined in dry dock *At this time*  
 Are the pipes, cocks, and valves arranged so as to prevent an unintentional connection between the sea and the bilge *Well arranged*  
 Is the screw shaft-tunnel water tight and fitted with a sluice door on bulkhead *Yes*

*Geo. Forester & Co* Manufacturers of Main Engines & Boilers -

I hereby certify that the whole of the above are correct particulars of the Machinery and Boilers of the Iron (or Wood) Screw (or Paddle) Steam Vessel *"Mangrove"* owned by *Messrs Horsfall & Coy* of the Port of *Liverpool* of *1375.26* Tons Register, and *300* Registered Horse Power, and that they have been carefully inspected and examined by me at *Liverpool* and found to be at this date, viz., *6<sup>th</sup> Feby* 1877 in good order and safe working condition.

*W. Lee* £15 - " - " 9/2/77  
 Lloyd's M. C. in P. Rec  
 9/2/77

*J. G. Kinghorn*  
 Engineer Surveyor to Lloyd's Register of Shipping.